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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,201	01/25/2005	Gyo Muramatsu	MURAMATSU2	8346
1444 7590 04/17/2008 BROWDY AND NEIMARK, P.L.L.C. 624 NINTH STREET, NW SUITE 300 WASHINGTON, DC 20001-5303				
EXAMINER				
PICKARD, ALISON K				
ART UNIT		PAPER NUMBER		
3676				
MAIL DATE		DELIVERY MODE		
04/17/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/523,201

**Applicant(s)**

MURAMATSU ET AL.

**Examiner**

Alison K. Pickard

**Art Unit**

3676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1.5 and 8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1.5 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

### DETAILED ACTION

1. The indicated allowability of claims 5 and 8 is withdrawn in view of the newly discovered reference(s) to Tanaka 6,149,162. Rejections based on the newly cited reference(s) follow. The examiner regrets any inconvenience.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onoda in view of Murase (2004/0052649) in view of Hanning.

Onoda discloses a piston ring having resin binder coating comprising PAI and a solid lubricant dispersed therein. Onoda does not disclose the coating is a PAI hybrid material. Murase teaches a silane modified PAI hybrid material with a solid lubricant for use on sliding components in engines. Murase teaches the solid lubricant is added in the claimed percentage ranges. Murase teaches the silane modified material provides improved heat, abrasion, and seizure resistance as well as improved adhesion over non-silane modified resins. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the piston ring coating by using the PAI-SiO<sub>2</sub> hybrid material taught by Murase to provide improved heat, abrasion, and seizure resistance as well as improved adhesion.

Onoda does not appear to disclose the particle size. Hannig teaches coatings for piston running surfaces and piston rings. The coatings are polyimide based and include solid lubricants

having particle sizes between 1 and 10 microns. This range is within the claimed range. And, it is desirable to keep particles small to keep the coatings smooth. All of the claimed elements are known in the prior art and one skilled in the art could have combined the elements as claimed by known method with no change and their respective function. The combination would have yielded predictable results. And the technique of using such particle sizes in similar coatings is known.

4. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onoda in view of Murase in view of Tanaka (6,149,162)

Onoda discloses a piston ring having a nitrided layer 6 and resin binder coating comprising PAI and a solid lubricant dispersed therein. Onoda does not disclose the coating is a PAI hybrid material. Murase teaches a silane modified PAI hybrid material with a solid lubricant for use on sliding components in engines. Murase teaches the solid lubricant is added in the claimed percentage ranges. Murase teaches the silane modified material provides improved heat, abrasion, and seizure resistance as well as improved adhesion over non-silane modified resins. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the piston ring coating by using the PAI-SiO<sub>2</sub> hybrid material taught by Murase to provide improved heat, abrasion, and seizure resistance as well as improved adhesion.

Onoda does not disclose the thickness of the nitrided layer. Tanaka teaches coatings for piston rings and includes a nitrided layer 2. Tanaka teaches the layer has a thickness of 10-90  $\mu\text{m}$ , which is within the claimed range. Applying a nitrided layer within the claimed thickness is a known technique within the piston coating art. Thus the claim would have been obvious

because the technique for improving coatings was part of the ordinary capabilities of a person of ordinary skill in the art in view of Tanaka to when improving coatings applied on a nitrided layer.

***Response to Arguments***

5. Applicant's arguments filed 1-11-08 have been fully considered but they are not persuasive.

Allowability of claims 5 and 8 has been withdrawn in view of the teachings of Tanaka (as well as Iwashita '385) and in view of the KSR ruling. Tanaka shows that it is known to apply nitrided coatings within the thickness range of the claims. The rationale being that a known technique would be suitable for similar situations, would yield predictable results, and would at least be obvious to try. Similar rationale is applied for Hanning. It is desirable to keep particles small to provide a smooth finish. And the smaller particles allow for a thinner coating to be used as well. This rationale does not have to be the same motivation or results Applicant has discovered. They still provide, at the very least, motivation to try.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/  
Primary Examiner, Art Unit 3676

AP